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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,014	03/14/2006	Tormen Massimo	Q92261	2979

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EXAMINER	
THROWER, LARRY W	

ART UNIT	PAPER NUMBER
1791	

NOTIFICATION DATE	DELIVERY MODE
09/13/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/562,014	MASSIMO, TORMEN	
	Examiner	Art Unit	
	LARRY THROWER	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 January 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22,24,25,27-31,33,34 and 37-40* is/are pending in the application.

4a) Of the above claim(s) *37 and 38* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22,24,25,27-31,33,34,39 and 40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 25, 2010 has been entered.

2. Claims 1 and 39 are amended; claims 23, 26, 32 and 35-36 are canceled; claims 37-38 are withdrawn. Claims 1-22, 24-25, 27-31, 33-34 and 39-40 are under examination.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-22, 24-25, 27-30, 33-34 and 39-40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou (US 5,772,905) in view of Kim (US 5,064,597).

- Regarding **claim 1**, Chou discloses a nano-impression lithographic process for forming a pattern in relief on a mass of polymeric material for use in micro-devices and nano-devices (abstract). The process includes preparing the mass of polymeric

material and a die having a surface region facing towards the mass of polymeric material and which reproduces in negative the pattern in relief (col. 4, lines 26-38), heating the die and putting the mass of polymeric material into contact with the die such that the polymeric material in contact with the a surface are subject to softening (col. 4, line 64 - col. 5, line 14), separating the die from the mass of polymeric material on the surface of the pattern in relief (col. 5, lines 1-14) and wherein the region of the die in which thermal energy is generated is in the form of a layer (figs. 1a-d).

- Chou is silent as to how the die is heated. However, Kim discloses a process for forming a pattern in relief on a mass of polymeric material (abstract), which includes heating only the surface region of the die by generation of thermal energy upon dissipation of another form of energy in at least one region of the die wherein the surface region of the die in which thermal energy is generated is in the form of a surface layer of the die (col. 4, lines 21-28). As taught by Kim, generation of thermal energy upon dissipation of another form of energy in at least one region of the die effectively heats the die (col. 4, lines 14-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have heated the die of Chou by generating thermal energy upon dissipation of another form of energy in at least one region of the die to effectively heat the die, as taught by Kim.
- Chou discloses that the region of the die in which thermal energy is generated is greater than the glass transition temperature of the polymeric material (col. 4, line 65 - col. 5, line 1), but is silent as to the amount of time it remains at this temperature.

However, absent evidence of unexpected results obtained from heating for the claimed time period, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected a suitable time period to effectively soften the polymer and fill the mold surface completely, resulting in a smooth surface finish as taught by Kim (col. 4, lines 5-35), the time period being a result effective variable routinely optimized by those of skill in the art. The optimization of a range or other variable within the claims that flows from the "normal desire of scientists or artisans to improve upon what is already generally known" is prima facie obvious. In re Peterson, 315 F.3d 1325, 1330 (Fed. Cir. 2003) (determining where in a disclosed set of percentage ranges the optimum combination of percentages lies is prima facie obvious). The discovery of an optimum value of a variable in a known process is usually obvious. In re Aller, 220 F.2d 454, 456 (C.C.P.A. 1955).

- Regarding **claim 2**, Chou discloses the mass of polymeric material having a three-dimensional form (col. 4, lines 13-38; figs. 1A-1D).
- Regarding **claim 3**, Chou discloses the heated die being at a smaller distance than 100 microns from the surface carrying the pattern in relief of the die (col.4, lines 39-49).
- Regarding **claim 4**, Chou discloses the mass of polymeric material being in the form of a deposited film (col. 4, lines 10-12).
- Regarding **claims 5 and 7**, Chou discloses that the region of the die in which thermal energy is generated is greater than the glass transition temperature of the

polymeric material (col. 4, line 65 - col. 5, line 1), but is silent as to the amount of time it remains at this temperature. However, absent evidence of unexpected results obtained from heating for the claimed time period, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected a suitable time period to effectively soften the polymer and fill the mold surface completely, resulting in a smooth surface finish as taught by Kim (col. 4, lines 5-35), the time period being a result effective variable routinely optimized by those of skill in the art. The optimization of a range or other variable within the claims that flows from the "normal desire of scientists or artisans to improve upon what is already generally known" is prima facie obvious. In re Peterson, 315 F.3d 1325, 1330 (Fed. Cir. 2003) (determining where in a disclosed set of percentage ranges the optimum combination of percentages lies is prima facie obvious). The discovery of an optimum value of a variable in a known process is usually obvious. In re Aller, 220 F.2d 454, 456 (C.C.P.A. 1955).

- Regarding **claim 6**, Chou discloses the process including a plurality of successive cycles of heating, contracting and separation (col. 5, lines 43-64; claim 7).
- Regarding **claim 8**, Chou discloses the heating and contacting being synchronized (col. 5, lines 1-14).
- Regarding **claim 9**, Chou discloses the die being put into contact under pressure with the polymer (col. 5, lines 1-14).
- Regarding **claim 10**, Chou discloses the pressure being pulsed

- Regarding **claim 11**, Chou discloses the pressure being mechanical (col. 5, lines 1-14).
- Regarding **claim 12**, Kim discloses the die being preheated to a desired temperature (col. 4, lines 21-35).
- Regarding **claim 13**, the quantity of thermal energy generated inherently varies in the process of Kim.
- Regarding **claim 14-15**, Chou discloses the polymer being polymethylmethacrylates.
- Regarding **claim 16**, Chou discloses at least one portion of the surface of the die being clad with a release agent (col. 4, lines 57-63).
- Regarding **claim 17**, Chou discloses after the pattern in relief has been formed on the surface of the mass of polymeric material, a treatment is performed with an attach agent so as to remove the polymeric material where it has been compressed (col. 5, lines 10-14).
- Regarding **claim 18**, Chou discloses that the surface region of the die which reproduces the pattern in relief in negative is aligned with pre-existing reference signs on the mass of polymeric material (col. 6, lines 42-67).
- Regarding **claims 19, 27 and 39**, Kim discloses the region of the die in which thermal energy is generated is of electrically conductive metal material (col. 4, lines 14-60).

- Regarding **claims 20**, Kim discloses the energy dissipated in heat being provided by an electric current which flows in an electrically conductive material (col. 4, lines 14-60).
- Regarding **claim 21**, Kim discloses the direction of flow of the electric current being substantially perpendicular to the direction of relative movement of the mass of polymeric material and the die (col. 4, lines 14-60; figs. 9-12).
- Regarding **claim 22**, Chou discloses the region of the die in which thermal energy is generated coinciding with the surface region which reproduces the pattern in relief in negative (col. 4, line 57 - col. 5, line 14; figs. 1a-d).
- Regarding **claims 24-25**, Chou discloses the region of the die in which thermal energy is generated is in the form of a layer having a thickness less than 2 microns which is nonuniform (col. 4, line 39 - col. 5, line 14; figs. 1a-d).
- Regarding **claim 28**, Chou discloses the electrically conductive material being a semiconductor (col. 4, lines 39-49).
- Regarding **claims 29-30**, Chou discloses that the layer of electrically conductive material is obtained by doping a surface layer of an intrinsically semiconductive substrate, and silicon on insulator (col. 4, lines 39-49).
- Regarding **claims 33-34**, Kim is silent as to how the electric current is generated. However, applying a potential difference or magnetic field were well known techniques for generating an electric current at the time the invention was made. It would have been obvious to one of ordinary skill in the art at the time the invention

was made to have selected a well known electric current generation technique in the lithographic process of modified Chou.

- Regarding **claim 40**, Chou discloses the semiconductor to be silicon (col. 4, lines 39-49).

5. **Claim 31** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chou (US 5,772,905) in view of Kim (US 5,064,597), as applied to claim 1 above, further in view of Zapka *et al*. (US 4,855,197).

- Chou is silent as to how the silicon is doped. However, Zapka *et al*. discloses a lithographic process which includes doping by ion implantation (abstract). As taught by Zapka *et al*., doping by ion implantation permits distortion-free transfer of a desired pattern (col. 2, lines 43-50). Thus, it would have been obvious to one of ordinary skill in the art to have modified the lithographic process of Chou by doping by ion implantation because as taught by Zapka *et al*., such doping creates a mold which permits distortion-free transfer of a desired pattern.

Response to Arguments

6. Applicant's arguments filed January 11, 2010 have been fully considered but they are not persuasive.

- Applicant argues that "it cannot anymore be denied that the main reference Chou (indicating that the entire mold has to be heated) teaches away from the present invention in which the surface layer is heated." (emphasis added). This argument

has been considered but is not persuasive for two reasons. First, Chou discloses that the mold and PMMA are heated, but is silent as to the entire mold being heated. Second, even if Chou had explicitly stated that the entire mold was heated, that statement alone would not amount to "teaching away." For a reference to teach away, the reference must suggest that the claimed combination should be avoided as undesirable or ineffective. See *In re Haruna*, 249 F.3d 1327, 1335 (Fed. Cir. 2001); *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). Chou makes no such suggestion. Chou does not constitute a teaching away from heating the surface layer of the mold because the disclosure does not criticize, discredit, or otherwise discourage such heating.

- Applicant further argues that Kim is directed to molding macro-articles and the instant claims are directed to micro- and nano-devices. This argument has been considered but is not persuasive. A person of ordinary skill is presumed to have the ability to select and utilize knowledge from other arts that are reasonably pertinent. *In re Antle*, 444 F.2d 1168, 1171-72, 58 CCPA 1382, 170 USPQ 285, 287-88 (CCPA 1971). Kim teaches that heating of the mold surface layer provides more flow of the resin at the same pressure, which one of ordinary skill in the art would readily recognize as being applicable to a wide variety of molding processes.
- Applicant finally argues that "Kim clearly teaches . . . that the mold layer 13 wherein heat is generated is covered by other insulating layers 15, 17, so it is not a surface layer." This argument has been considered but is not persuasive. At col. 4, lines 21-28, Kim discloses that "slight preheating of the mold **surface layer** may be

required to process a plastic having a high glass transition temperature or a high melting point or to provide more flow of the resin at the same pressure. Preheating of the mold **surface** can be accomplished by infrared, electric current, . . ." (emphasis added). Thus, directly contrary to Applicant's assertion, Kim discloses heating the mold surface layer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LARRY THROWER whose telephone number is 571-270-5517. The examiner can normally be reached on Monday through Friday from 9:30AM-6PM est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina A. Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Larry Thrower/
Examiner, Art Unit 1791

/Christina Johnson/

Supervisory Patent Examiner, Art Unit 1791